Harlan Reservoir
2009 Fall Survey Summary

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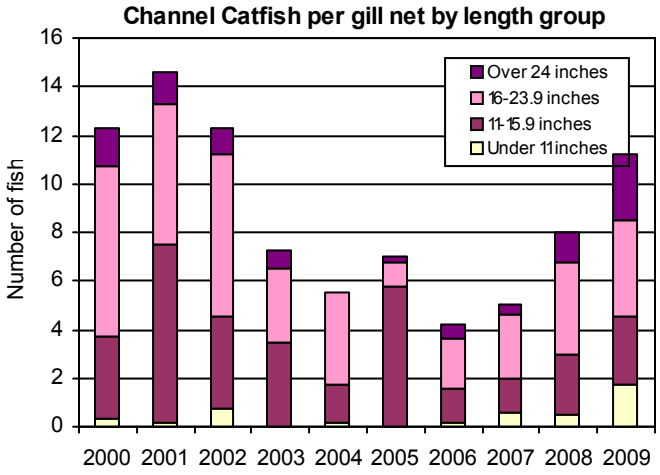
The following text and graphs are summaries of netting surveys completed during October 2009 at Harlan Reservoir. For comparative purposes, results from previous years are also included. Fish populations are sampled each fall at Harlan using gill and frame nets. Gill nets are used to sample fish species found primarily in open water, such as walleye, while frame nets are used to sample shoreline oriented fish, such as crappie. The nets are set each year at approximately the same locations and dates as previous years, which reduces variability and allows for trend comparisons of species abundance and size distribution.

The following graphs show the total number of fish caught per net and the relative abundance of fish within several length categories. The text provides a brief explanation of the information contained in the graphs.

Channel Catfish

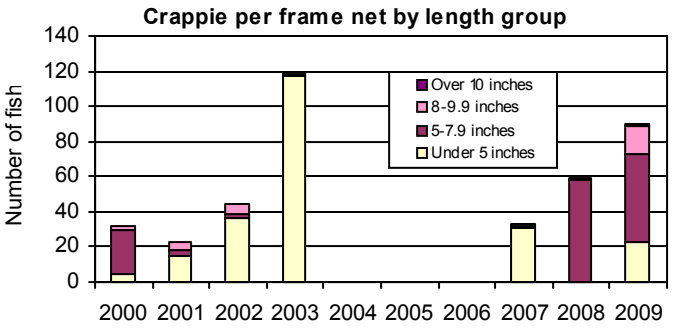
Channel catfish numbers have increased the last three years from the long-term low in 2006, and are near the peak years of 2000-2002. Catfish are present in all size groups, including an increase for catfish over 24 inches.



Recruitment of catfish under 11 inches has been present from 2007 through 2009. Recruitment has improved with 2007 and 2009 stocking and improved water levels and habitat. A new channel catfish regulation was approved for 2009 which reduces the daily bag limit to five fish. Harlan anglers should expect good catfishing in 2010 with a good variety of sizes available.

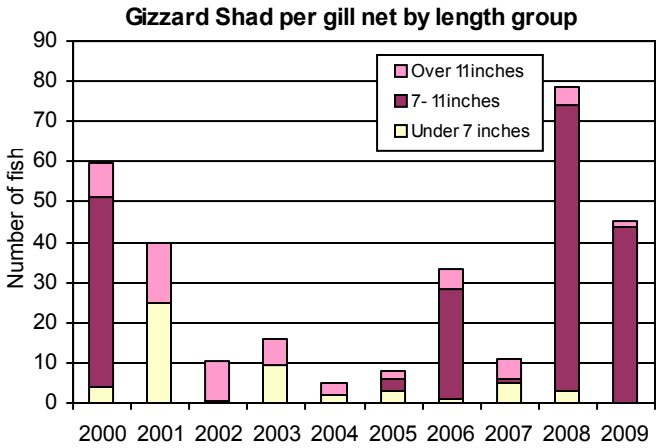
Crappie

Trap netting for crappie was completed the last three years with high water levels. Good year-classes of crappie have resulted from higher water levels and abundant shoreline and cove habitats. The 2007 and 2008 year-classes of crappie are both strong and were well represented in the 2009 survey. The crappie from the 2007 year-class range from 7-9 inches long, and the 2008 year-class range from 4 to 6 inches long. Recent strong recruitment and continued high water levels should provide good future crappie fishing at Harlan Reservoir.



Gizzard Shad

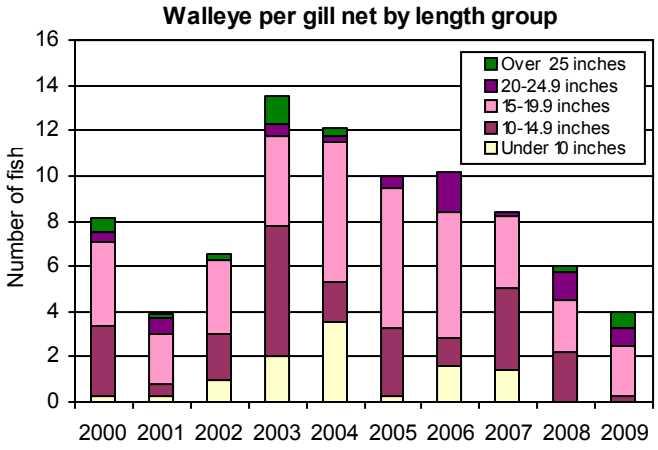
Gizzard shad numbers declined from the peak in 2008. Most shad sampled ranged from 9 to 10 inches long. Large numbers of intermediate-sized shad result in more competition for food resources with juvenile gamefish, and may reduce survival of young-of-the-year walleye and white bass.



The 2009 netting survey, and information from ongoing research work, indicate poor young-of-year shad production in 2009. Gizzard shad are the most important prey species in Harlan Reservoir and serve as food for all the major game fish populations. Poor production of young shad may lead to lower annual recruitment and growth of predator fish species such as walleye and white bass.

Walleye

Walleye numbers dropped for the fourth year in a row. No young-of-the-year walleye were sampled in 2008 or 2009. Sampling efficiencies for walleye and other species may be negatively affected by abundant flooded vegetation and uneven fish distribution.



The current walleye population contains fish in various size groups, with fish from 15 to 20 inches the most common. There was a considerable increase in walleye sampled over 25 inches in length. In fact, the number of walleye over 25 inches was the second highest since 2000.

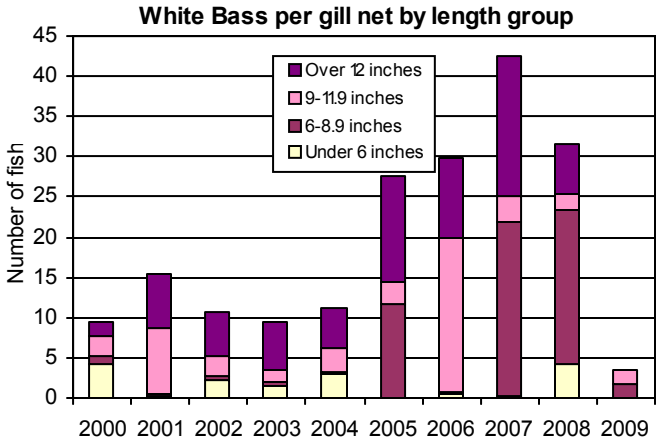
Walleye ages ranged from one through nine. The most abundant walleye were age two (31% of the sample), which correspond to the walleye fry stocking in 2007. Ages one to three made up 56% of the walleye sample, while walleye over 25 inches made up 15% of the sample.

To be consistent with other Nebraska reservoirs, a new walleye fishing regulation went into effect in 2009. The new regulation wording is: "*a daily bag limit of four may include one walleye from 15 through 18 inches and three over 18 inches or four over 18 inches, but no more than one over 22 inches in length allowed in the daily bag*". This regulation has been in effect at Merritt Reservoir for many years and has shown promising results. Impacts at Harlan Reservoir will be monitored over the next few years to determine its success.

Although overall walleye numbers are down, there is representation in most age groups, and good numbers of walleye over 25 inches long. High water levels, improved aquatic habitat conditions, and future stocking programs should contribute to improved walleye numbers.

White Bass

White bass numbers sampled in 2009 dropped drastically from the high levels of 2005-2008. As with some other species, sampling efficiency in 2009 may have been affected by abundant flooded vegetation and uneven fish distribution with high reservoir water levels.



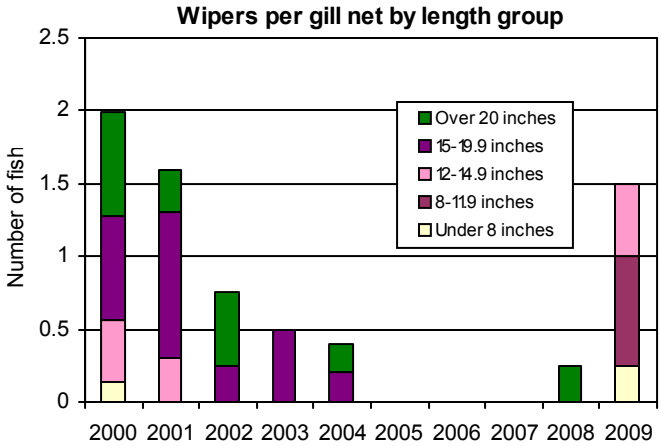
Although there was very good white bass recruitment in 2007 and 2008, no young-of-the-year were sampled in 2009.

All white bass sampled were from the 2007 and 2008 year-classes, and ranged from 7 to 11 inches long

The population of white bass had been very high from 2005-2008. The large decline in 2009 was unexpected. There was no documentation of high harvest or movement through the dam. With no logical explanation for the large decline, it is speculated that 2009 sampling was not representative of the current white bass population.

Wipers

Wiper numbers are low at Harlan Reservoir, but an increase was observed in 2009. No wipers were sampled from 2005 to 2007, and only one wiper was sampled in 2008. A total of 6 wipers were sampled in 2009, mostly from 8 to 13 inches long. All wipers sampled were from the 2008 year-class, which corresponds to the last stocking.



Results from a 2002-2003 food habit study at Harlan involving major predator fish species indicated very little competition between wipers and walleye. Based on those results, wiper stocking was reinstated in 2005, with stockings planned every three years. The current stocking program should improve the population to provide a sustainable sport fishery.

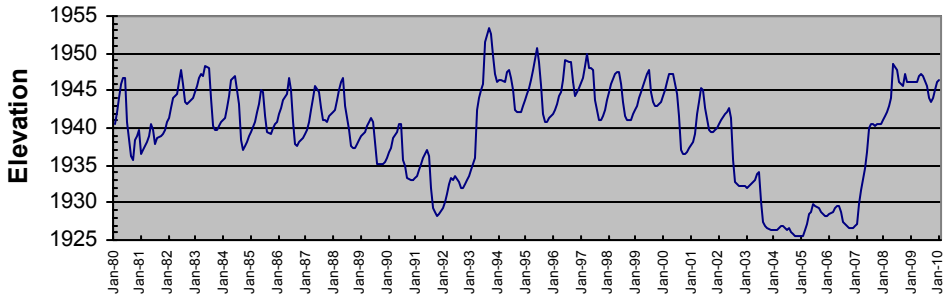
Additional Information about Harlan Reservoir

Water Levels

Harlan Reservoir water levels remained high through 2009. The reservoir exceeded conservation pool in May and June, and only dropped a few feet for irrigation releases. Water releases were necessary in the fall to maintain the reservoir near conservation pool. Excellent aquatic habitat conditions continued through 2009 with many acres of flooded terrestrial vegetation such as willows and cottonwoods.

High water levels and increased aquatic habitat have resulted in good recruitment of several fish species. Although 2009 recruitment was not well-documented, several species had good recruitment in 2007 and 2008.

Water elevations at Harlan Reservoir Since 1980
Conservation Pool is 1946msl



Fish Stocking

Due to declining population trends and low recruitment, Harlan Reservoir received a stocking of **channel catfish** in 2007 and 2009. Each catfish stocking consist of 10 fish per acre that were 5 to 7 inches long. Based on survey results, the catfish population has recovered well enough to discontinue future stockings.

Based on results of several years of research into wiper interactions in Harlan Reservoir, **wiper** stockings started again in 2005 and are scheduled for every three years. The most recent stocking was about 70,000 wiper fingerlings in 2008, and these fish were represented in the 2009 survey.

About 11 million **walleye** fry were stocked in 2007 and 14 million fry in 2009. Based on recent stocking success, walleye fry are requested for future stockings at a rate of 1,000 per surface acre of water.

To take advantage of shoreline habitat associated with higher lake levels, stocking of largemouth bass and northern pike were completed in 2008 and 2009. Future stocking of these species will be dependent on the availability of shoreline habitat, and numbers based on acres of available shoreline habitat.

Walleye Egg Collections

Walleye eggs were collected at Harlan Reservoir from 2003 through 2006, with most of the eggs used for walleye fry stockings in Nebraska. No walleye eggs have been collected from Harlan since 2006, and none are planned for 2010.

Additional Information Continued...

Aquatic Habitat Project at Harlan Reservoir

Harlan Reservoir was included on the initial list of sites as part of Nebraska's Aquatic Habitat Program. This program is designed to rehabilitate aquatic habitat in aging reservoirs to provide enhanced fishing opportunities. The Aquatic Habitat Program utilizes funding generated from Nebraska's Aquatic Habitat Stamp and various matching sources.

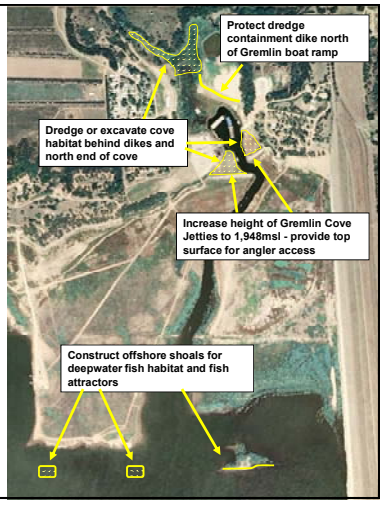
The project proposal document for the aquatic habitat project at Harlan Reservoir was completed in the spring of 2008. The project proposal identifies possible locations and techniques for habitat improvements. The overall goal will be to restore and protect selected shoreline, point, and cove habitats at Harlan Reservoir in order to improve or sustain recreational fisheries.

The next step for Harlan's project will be a Request for Proposal document to obtain engineering services for final design, construction specifications, and oversight for the project. Due to funding limitations, this step has been postponed until 2012.

Uncertain water levels at Harlan Reservoir will present a special challenge for the design and construction work. The project proposal will likely include sites for both low and high water conditions, and individual sites will be completed contingent on future water levels in the lake. Most probable locations for work at Harlan will include Gremlin Cove and Patterson Harbor, and proposed activities are included in the following diagrams.

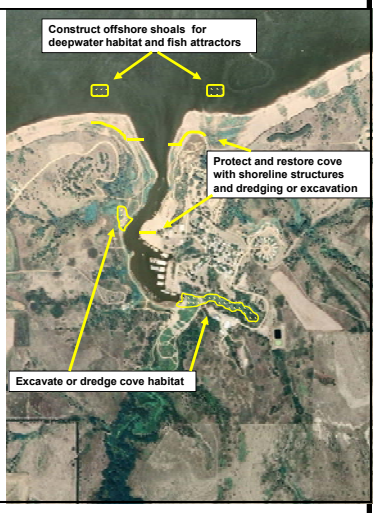
Gremlin Cove Site

- Increase height of existing jetties to protect cove habitat, boat access, and marina operation, < 1944
- Protect dike north of Gremlin boat ramp, < 1938
- Excavation behind jetties and north end of cove, < 1934
- Dredging behind jetties and north end of cove, > 1938
- Construct offshore shoals for deepwater fish habitat and fish attractors (placement dependent on detailed depth profile map)



Patterson Harbor Site

- Protect and restore cove habitat
- Shoreline jetties or breakwaters (1927-1940 depending on length of jetty)
- Excavate (<1929) or dredge (>1935) cove habitat
- Construct offshore shoals for deepwater habitat - fish attractors (any elevation)



Public Information

Paper copies of this summary are supplied to the US Army Corps of Engineers Office in Republican City. Also, the Game and Parks fisheries staff presents an update of Harlan fisheries management at the annual Harlan Walleye Anglers Group meeting in Holdrege.

For additional information about fisheries management at Harlan Reservoir, please contact the NGPC Kearney office at 308-865-5310 or by email at the addresses listed below.

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